RICHTER OPTICA

Richter Optica

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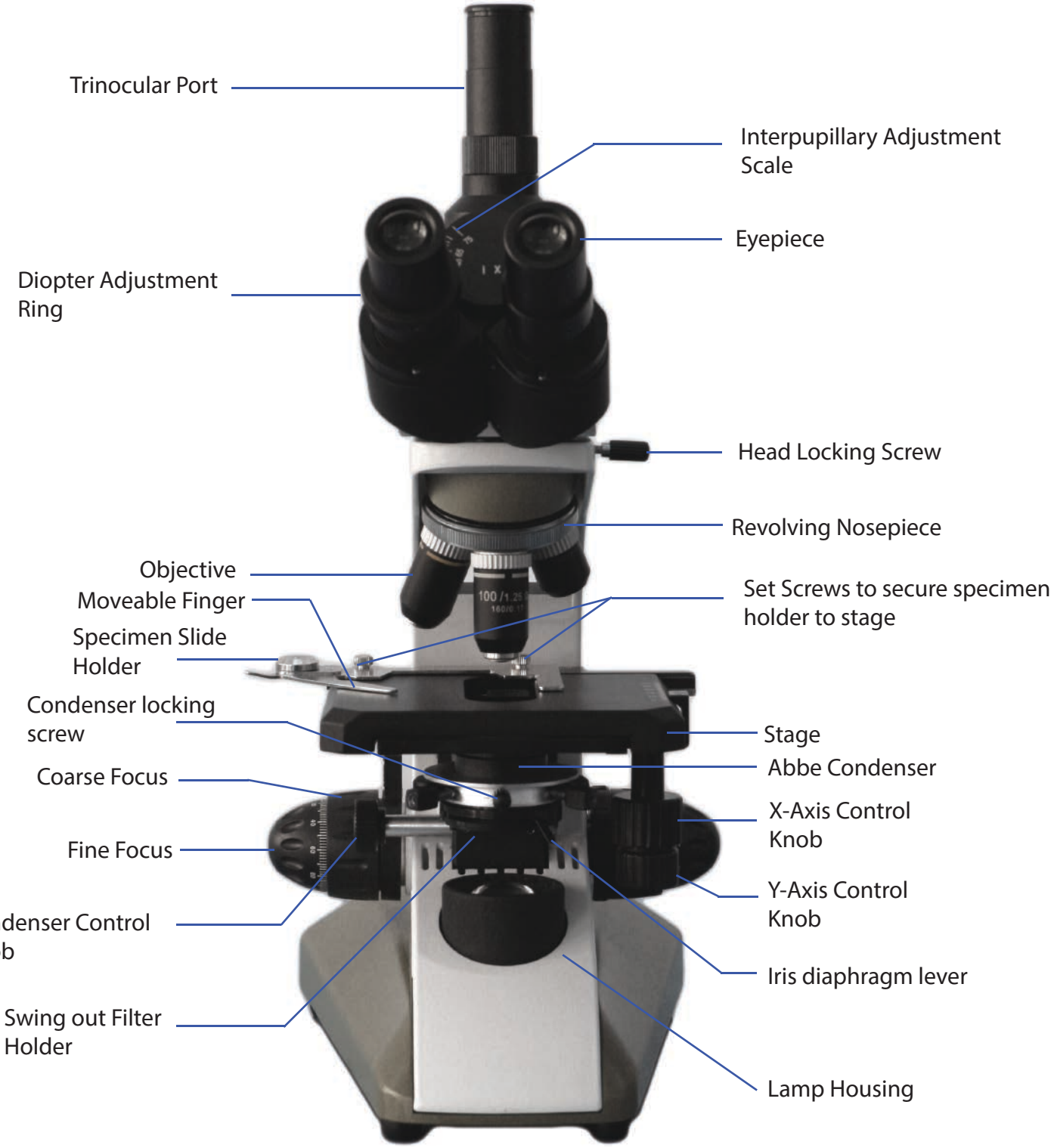
Instructions for Models:
U1B, U1T, U1D, U1LCD
Universty Student Biological Microscope


Trinocular Port
Interpupillary Adjustment Scale
Eyepiece
Diopter Adjustment Ring
Head Locking Screw
Revolving Nosepiece
Objective
Moveable Finger
Specimen Slide Holder
Set Screws to secure specimen holder to stage
Condenser locking screw
Stage
Abbe Condenser
Coarse Focus
X-Axis Control Knob
Fine Focus
Y-Axis Control Knob
Condenser Control Knob
Iris diaphragm lever
Swing out Filter Holder
Lamp Housing

Thank you for your purchase of a Richter Optica microscope. The information in this manual is provided to answer most questions that can arise when operating your microscope and to help you avoid unneccesary maintenance expenses in the future.

Please carefully read instructions before operating microscope. Nomenclature used to describe components and controls are identified on opposite page.

UNPACKING

Do not discard styrofoam container or packing materials until you are sure shipment is complete and undamaged (retain styrofoam shipping container to store your microscope when it is not in use). Remove all tape and packing material used to protect microscope during shipment. Make certain lens surfaces do not come in contact with dirt, fingerprints or oil. Damage of lens surfaces occur when they come in contact with such contaminants, and image quality is reduced.

OPERATION

A. Illumination

1. Before operating microscope, adjust intensity control located on side of base to the minimum position. This should be done prior to each time the base is turned on or off. This will extend bulb life.

2. Insert power plug into base of microscope. Then insert plug into outlet.

3. Push rocker switch at back of the base to on position.

4. Rotate intensity dial on illuminator base until the image is illuminated.

5. Adjust intensity of light to match requirements of objective and specimen slide.

B. Interpupillary Adjustment of Viewing Head

1. Looking through microscope, adjust distance between the two eyepieces by grasping the eyetubes and moving them either closer or farther apart.

2. When a full field of view is observed throught both tubes, and images blend into one, interpupillary distance is corrected for your eyes. Check the interpupillary scale and note index reading for future reference, in case other users will be changing this adjustment from time to time.

3. Adjust the diopter scales, located on each eyetube, to the same numerical value as indicated on the interpupillary scale. This must be done in order to maintain parfocality of objective lenses. If interpupillary distance is changed, adjust eyepiece diopters accordingly.

C. Focusing the Microscope

1. Position the 4x objective lens into the optical path, making sure that lens clicks into its proper position.

2. Place standard specimen slide (cover slip up) on top of stage surface.

    a. Swing movable finger on slide holder outward. Place specimen slide against fixed side of slide holder. Slowly release moveable finger until it makes contact with the specimen slide.

3. Rotate coarse focusing controls until the specimen comes into focus.

4. Adjust fine focus controls until specimen is in sharp focus.

5. Adjust diopter for difference in eyesight.

    a. Using right eye, peer into the right eyepiece tube. Adjust sharpness of image by turning diopter adjustment located on left eyepiece tube.

6. Adjust the aperture (opening) of the iris diaphragm.

Iris diaphragm should not be used to control the brightness of illumination, use light intensity control knob to adjust light level. Iris diaphragms are designed to help achieve high resolution of specimen and provide contrast in the image. Smaller apertures will deliver contrast to the image. However, closing aperture too much will reduce resolution. Experimentation is the best method of determining the correct opening of the diaphragm. Some suggested openings for the iris diaphragm are:

Objective	Diaphragm Opening
4x	1/8 open
10x	1/8 to 1/4 open
40x	1/4 to 1/2 open
100x	1/2 to 3/4 open

7. Changing magnification.

    a. Rotate revolving nosepiece to postition 10x objective into optical path.

    b. This microscope has been parfocalized, which allows changes from one objective to another while requiring only a slight adjustment of the fine focus controls.

    c. When changing to the 40x and 100x objective lens, care must be exercised in order to prevent damaging the front lens element and specimen slide.

    d. In order to obtain the maximum resolution of the 100x oil immersion lens, it is necessary to apply immersion oil between the cover glass of slide and the front lens of the objective.

        1.) Use a very small amount of immersion oil. Only the tip of the lens should ever come in contact with the oil.

1. Optical Maintenance

   a. Do not attempt to disassemble any lens component. Consult an expert technical service company when repairs not covered by these instructions are required.

   b. Prior to cleaning any lens surface, brush dust or dirt off lens surfaces using a camel hair brush. Or use air to blow dust and lint off surfaces. Compressed air, available at any computer supply store, is a good source of clean air.

   c. Cleaning eyepiece lenses.

      Do not remove eyepiece from eyepiece tube. Clean only the outer surface. Breathe on lens to dampen surface, then wipe with lens paper. Do not wipe lens surface while dry as lenses are scratched very easily. Wipe in a circular motion from center to outer edges.

   d. Cleaning objective lenses.

      Do not remove objective lenses from the microscope. Clean front lens element only. Using a cotton swab saturated with distilled water, clean front lens surface. Inspect the lens using a magnifying glass to ensure that the element is clean. If immersion oil or specimen material of any kind is evident, use a cotton swab dipped in a small amount of Windex to clean all foreign material from objective lens surface. Such material will reduce or totally block image quality.

   e. Cleaning condenser lens.

      Clean only the top lens surface, visible when looking through hole in top of stage. Use same procedure as used for eyepiece or objective lenses.

   f. Illuminator condenser lens.

      Use same procedure as used for eyepiece or objective lenses.

2. Electrical Maintenance

   WARNING: FOR YOUR SAFETY, TURN SWITCH OFF AND REMOVE PLUG FROM POWER SOURCE OUTLET BEFORE MAINTAINING YOUR MICROSCOPE.

   1. Replacement of Bulb

      a. Carefully pull magnetic lamp housing up and off of the microscope to reveal the bulb.

      b. Using a tissue or cloth gently grasp the halogen bulb, pull straight out of lamp socket.

      c. Your microscope requires an LED bulb available from your microscope dealer.

      d. Make certain that the new bulb is clean, as fingerprints on the bulb can affect light transmission. Grasping bulb gently with a tissue or cloth, insert pins straight into the lamp socket.

      e. Replace magnetic lamp housing.

2. Replacement of Fuse

The fuse is located on the back of the microscope on the right side of the power plug. To remove the fuse from the holder, insert a 6mm screwdriver blade into slot located in rear of fuse cap. Slightly depress and rotate screwdriver to release the fuse cap. Pull cap and fuse out of fuse holder. Insert proper 1amp electronic fuse into fuse cap. Using screwdriver, rotate fuse cap assembly in opposite direction of arrow until guide slot engages, depress fuse cap and rotate 1/4 turn to lock into fuse.

TROUBLESHOOTING

ELECTRICAL

Problem	Reason for Problem	Solution
Light Fails to Operate	Outlet inoperative	Have qualified service technician repair outlet
	AC Power cord not connected	plug into outlet
	Bulb burned out	Replace with new LED bulb
	Fuse burned out	Replace with new 1 amp fuse
	Fuse burns out too soon	Replace with proper 1 amp fuse
	Fuse blows instantly when replaced.	Unit has short, have qualified service technician repair electrical short

Problem	Reason for Problem	Solution
Light burns out too soon	The voltage is too high	Adjust intensity control to the minimum position before turning the power switch on.
Light bulb burns out immediately	Incorrect lamp used	Have qualified service technician use proper bulb. Plug unit into proper outlet 120v or 220v.
Light Flickers	Lamp not properly inserted into socket Lamp about to burn out Fuse holder not locked into proper position Loose connection at AC outlet	Have qualified service technician make repairs.

TROUBLESHOOTING

IMAGE QUALITY

Problem	Reason for Problem	Solution
No Image	Nosepiece not indexed properly	Move revolving nosepiece until objective lens clicks into position.
	Light too bright	Adjust light intensity control to a lower position.
Poor Resolution (Image not sharp)	Objective lens dirty	Clean objective lens
	Eyepiece lens dirty	Clean eyepiece lens
	Slide upside down	Turn specimen slide over cover slip facing up
	Cover slip on specimen slide too thick	Use 0.17mm thick cover slip
	Too much light	Adjust light intensity control to a lower position.
	Condenser lens dirty	Clean condenser lens
	Rack stop not set at a proper position	Adjust rack stop
Spots in field of view	Eyepiece dirty	Clean eyepiece lens
	Specimen slide dirty	Clean slide
	Condenser lens dirty	Clean lens of condenser
Uneven illumination of field	Nosepiece not properly indexed	Revolve nosepiece into positive index stop
	Diaphragm not properly indexed	Adjust diaphragm to proper level

MECHANICAL PROBLEM

Problem	Reason for Problem	Solution
Does not stay in focus	Stage drops down	Adjust tension adjustment knob